Veterinarians as scientific contributors – and a plea to rename *Salmonella* as *Smithella*

Sehrawat and Kaul[1] are correct when they state that veterinarian scientists have contributed greatly to our understanding of human diseases. However, some clarifications are in order.

Table 1 in their note states that Robin Coombs developed his test in 1994. However, the correct date is 1945 (ref. 2). Those who have read Arthur Hailey's *The Final Diagnosis* (written in 1959) would know that the Coombs test is the basis of one of the crucial incidents in the book.

Sehrawat and Kaul also state that *Salmonella* was described by Daniel Salmon. This is the general belief, but is not quite correct. As Katscher[3] (among others) has pointed out, Daniel Salmon was Director of the Bureau of Animal Industry of the US Department of Agriculture, and he put his name as first author on the paper – though it was Theobald Smith, his subordinate, who had discovered the organism. (This must constitute a markedly unusual form of gift authorship.) Despite this travesty of justice, Smith still makes it to the table (ref. 1) for his research on Texas cattle fever.

Katscher goes on to state that ideally the organism should be renamed *Smithella*, rather than *Salmonella*, but that this is unlikely to happen because the word *Salmonella* is so deeply entrenched in our minds. I disagree. Given that cities and roads are constantly being renamed all over the world and even organisms and diseases are being renamed, why should *Salmonella* be the exception? Just some examples of organisms with a new name are *Campylobacter pylori* (now *Helicobacter pylori*), and *Rochalimaea* (now *Bartonella*). Some diseases have been renamed because their discoverers were Nazi physicians. One such example is Reiter's disease, which is now called 'reactive arthritis'[4].

I see it as distinctly unethical to continue with the term *Salmonella/salmonellosis* and believe it is time to honour the man responsible for detecting the organism – Theobald Smith, father of American microbiology and one of the greatest veterinarian researchers ever – by renaming the organism and the disease as *Smithella/Smithellosis*.

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Enhancing soil health of seri-farmers of North India through digital soil health card scheme

Sericulture is an agro-based, labour-intensive industry which has always occupied a prime postion in Indian economy. It refers to cultivation of silkworms to produce silk. It provides income and employment to the rural poor, especially farmers with small landholdings and the marginalized and weaker sections of society. It generated employment for approximately 9.20 million persons in rural and semi-urban areas in India during 2016–17 compared to 8.3 million persons in 2015–16 (ref. 1). India is the second largest producer of raw silk after China, and the biggest consumer of raw silk and silk fabrics. India has the unique distinction of being the only country producing all the five known commercial silks, namely mulberry, tropical tasar, oak tasar, eri and muga. Mulberry, the primary food plant of silkworm, occupies by far the largest area (2.1 lakh hectares) under cultivation and contributes maximum amount (70%) of total raw silk production in the country.

In North India, majority of rearers have taken up mulberry cultivation on small land-holdings as a life-sustaining occupation. As a result of financial constraints and ignorance on part of majority of stakeholders and several others, mulberry is largely cultivated in nutrient-deficient systems. The imbalanced application of chemical fertilizers is widely blamed for low yields, poor soil health and pollution of water resources. Soil health is an important factor which has to be analysed before silkworm rearing as nutrient status of the soil will determine the quality of leaf produced. This in turn affects the production of good-quality silk[2].

To increase soil fertility, productivity and soil sustainability, the Honourable Prime Minister, Narendra Modi, launched a project called the 'Soil Health Card' (SHC) scheme on 17 February 2015 in Suratgarh, Rajasthan, to help farmers understand the use of nutrients and fertilizers in order to increase soil productivity. SHC is a Government of India scheme promoted by the Department of Agriculture and Co-operation under the Ministry of Agriculture and Farmers' Welfare. In order to address soil health issues of sericulture farmers of the northwestern Indian states and to provide them balanced recommendation of fertilizers for sustainable sericulture, the SHC project has been initiated by the Central Silk Board, Bengaluru at the Regional Sericulture Research Station, Jammu. SHC project is designed for soil testing and customized fertilizer recommendations, with the hope that scientific information will lead seri-farmers to optimize fertilizer use and promote site-specific nutrient management involving soil test-based application of fertilizers for sustainable sericulture promotion.

Under the project, soil samples were collected from the field of sericulture farmers of northwestern Indian states with the help of Global-Positioning System by standard soil sampling procedure. The collected soil samples were analysed for pH, electrical conductivity (EC), organic carbon (OC), available N, P, K, S and micronutrients (Zn, Cu, Fe, Mn, B) in a mini soil lab named 'Mridaparikshak' developed by ICAR-Indian Institute of Soil Science, Bhopal[3]. The analysed soil data were uploaded on the SHC portal and digital SHC was generated for each seri-farmer with appropriate fertilizer recommendation.

SHC is a printed report which contains all details pertaining to a farmer and soil sample, soil test results, fertilizers/amendments recommendation, time of fertilizer application, including bio-fertilizer for mulberry crop. SHC displays the status of soil with respect to 12 parameters, namely N, P, K, S, Zn, Fe, Cu, Mn, B, pH, EC and OC. A total of 2000 digital SHCs have been prepared and distributed among sericulture farmers of northwestern Indian states with timely and balanced fertilizer dose and its application which is valid for next three years.

SHC is a beneficial scheme for farmers. It is helping sericulture farmers of northwestern Indian states to increase the productivity and quality leaf production of mulberry, which ultimately has an impact on the sustainability and profitability of Indian silk industry to make the country self-sufficient in silk production in the world.

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Increasing forest or forest cover in India

The Indian Forest Act 1865 defines 'forest' as in dictionary meaning as 'land covered with trees, brushwood and jungle'. Subsequent amendment of the Act in 1878 led to areas under plantation on barren land also included as forest. In the famous T. N. Godavarman Thirumalpad versus Union of India case in 1996, the Honourable Supreme Court of India referred to forest as in dictionary meaning, irrespective of nature of ownership and classification thereof[1].

The Forest Survey of India (FSI) considers all land parcels greater than 1 ha in size and with more than 10% canopy cover for assessing forest cover in India. The National Forest Policy 1988 proposed that India should have at least 33% of its geographical area under forest/tree cover. The FSI in its 2017 assessment, reported forest and tree (trees outside forest) cover in India at 24%, and to achieve the target of 33%, it would require adding about 28 m ha under forest/tree cover.

India has shown continual increase in forest cover from 65 m ha in 2001 to 70.8 m ha in 2017, but not without loss of existing forest. Arunachal Pradesh and Himachal Pradesh combined have lost 185 sq. km of forest under very dense forest (VDF) category, while Andhra Pradesh and Karnataka have added about 4255 sq. km under VDF between 2015 and 2017 (ref. 2). The loss of pristine rainforests could have been compensated with growth of monoculture plantations, as only managed plantations can show such quick results in a short period. What FSI clearly misses to publish in its State of Forest Report is the type of forest lost or gained.

While monoculture plantations increase forest cover and sequestration, do they improve biodiversity, provide soil and water conservation and support the livelihood of millions of forest-dependent communities? The important question then is should we increase forest or forest cover in India?

Ill-conceived forestry projects under the Clean Development Mechanisms aimed at increasing tree cover to harness carbon sequestration have over long term been detrimental to the ecology of the region and for communities[3]. Such afforestation practices can severely compromise ecosystem services, including hydrology, soil nutrient cycles and reduce biodiversity, as has been observed elsewhere[4,5]. Targeting increased forest cover in arid regions of India like Gujarat, Rajasthan, Maharashtra and Andhra Pradesh could have high trade-offs, as these states have high livestock populations that require open land for grazing[6] and the native grassland ecosystems are critical for conservation of species like Great Indian Bustard.

Forests in India have long been managed for their timber value, but the Forest Conservation Act 1980 and Forest Policy 1988 shifted forest management focus more towards conserving biodiversity and meeting the judicial needs of local communities. The National Working Plan Code (revised in 2014), based on which all forest working plans are made, envisages the same.

Targeting to achieve forest/tree cover set in National Forest Policy and India's commitment under the Intended Nationally Determined Contribution (INDC) to the Paris commitment, where it has been proposed to create 2.5–3 billion tonnes of carbon sequestration through additional forest and tree cover by 2030 (ref.